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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/643,278	08/22/2000	Jyhchau Horng		8659

7590 05/10/2004

Patent Department
Mitsubishi Electric Information Technology
Center America Inc
201 Broadway
Cambridge, MA 02139

EXAMINER

TSE, YOUNG TOI

ART UNIT	PAPER NUMBER
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2634

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DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/643,278

Applicant(s)

HORNG ET AL.

Examiner

YOUNG T. TSE

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: page 1, line 2, Applicant is requested to update the serial number 09/487,095, now U.S. Patent No. 6,650,653 B1; page 2, line 18, the word – is – should be deleted; and page 5, line 7, “a” should be deleted and line 16, “ration” should be – ratio --. Appropriate correction is required.

Claim Objections

2. Claims 4, 6, 11 and 14-16 are objected to because of the following informalities: in claim 4, line 1, “claim 1” should be – claim 3 – to avoid the lacking of antecedent basis of “each rake finger”; in claim 6, line 1, delete the word – further --; in claim 11, line 2, “contributing” should be – contributing symbols --; in line 1 of both claims 14 and 15, “in claim 10” should be – of claim 10 --; and in claim 16, line 7, the word “a” should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-9 and 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 5, applicant is requested to clarify the difference between "symbol time T_b " and "symbol times T_b ".

Wherein claims 6-9 are directly or indirectly depended upon claim 5.

In claim 11, line 7, it is unclear what is the "(N-1)" since it does not recite in the equations of the claim.

In claim 12 (lines 1-2) and claim 13 (line 2), the phrases "the training signal" and "the decision symbols" both lack antecedent basis.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-10, 12 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsutsui et al..

Tsutsui et al. (U.S. Patent No. 6,385,181 B1) discloses an array antenna system in Figure 15 of a wireless base station in CDMA mobile communications has a beam

former for forming a plurality of electric beams by applying beam forming to multipath signals received by a plurality of antenna elements of an array antenna and inputting the beams to disspreading/delay-adjusting units (fingers) provided for respective path of multipath.

With respect to claim 1, the CEMA receiver comprises a plurality of antennas 31; a plurality of rake receivers 34 each having a plurality of rake fingers 34b; an interference canceller including an MMSE adaptive controller 41, a weighting unit 42, a channel estimation unit 43, and an error generator 44; and a diversity combiner 36. See column 14, lines 9-26.

With respect to claim 2, although Tsutsui does not explicitly show or suggest the antennas are spaced about three to five times the waveform of the baseband signal, it is well known in the time or frequency diversity system to separate or space the antennas of the receiver three to five times the waveform of the baseband signal which is based on the design choice of the diversity receiver.

With respect to claim 3 and claim 4, the frequency in each of the rake fingers are different from each other because each rake finger is independently connected to an antenna and each rake finger has a different time delay as well known in the art.

With respect to claim 5, each rake finger is sampled at a symbol time to form a down sampled signal for the weighting unit 43 because each rake finger is independently connected to an antenna.

With respect to claim 6, the weighting unit 42 includes a plurality of taps or coefficients controlled by the MMSE adaptive controller 41.

With respect to claim 7, the error generator 44 includes a subtractor for subtracting the output signal of the weighting unit 42 and a reference signal either selected from a sign or decision circuit 37 or a pilot signal.

With respect to claim 8, the pilot signal is an initial training signal.

With respect to claim 9, the training signal is a predetermined random sequence which is well known generated by a polynomial known to a receiver.

With respect to claim 10, the error signal is generated by the error generator 44 and the contributing symbol is generated by the channel estimator 43.

With respect to claim 12, it is well known in the art that the training signal is periodically transmitted by a transmitter circuit.

With respect to claim 16, the step of receiving the baseband signal is performed by the antennas 31, the frequency shifting and down sampling steps of the baseband signal are performed by the rake fingers 34b, the filtering step is performed by the MMSE adaptive controller 41, the weighting unit 42, the channel estimation unit 43, and then error generator 44, and the combining step is performed by the diversity combiner 36.

Allowable Subject Matter

7. Claims 11 and 13-15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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8. The following is a statement of reasons for the indication of allowable subject matter: Sato, Bruchert et al., Sawahashi et al., Vasic, Tirola et al., and Kenney are related to diversity receivers, however, the prior art fails to show or suggest the decision symbol and the weighting factor of the adaptive filter are based on the equations of claim 11 or a frequency offset of the adaptive filter is estimated by identifying a location of the decision symbol with a smallest error signal as recited in claim 13.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Young Tse** whose telephone number is **(703) 305-4736**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Stephen Chin**, can be reached at **(703) 305-4714**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

P.O. Box 1450

Alexandria, VA 22313-1450

or faxed to:

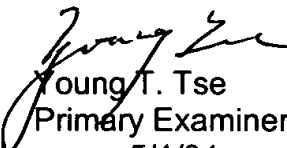
(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.


Young T. Tse
Primary Examiner
5/1/04